

CLAIMS

What is claimed is:

1. An off-track retry method for recovering data incorrectly read due to a read error caused by an off-track error in a disk drive, the off-track retry method comprising:
 - extracting read gain characteristics while varying an off-track amount;
 - determining an off-track amount, based upon the read gain characteristics;
 - reading data using the determined off-track amount;
 - determining whether the read data is normal; and
 - determining whether the data incorrectly read due to the read error has been recovered.
2. The off-track retry method of claim 1, wherein the reading the data comprises:
 - reading the data by moving a head away from a centerline of a track by up to a determined off-track amount; and
 - reading the data by moving the head away from the centerline of the track by up to an off-track range having a predetermined difference with the determined off-track amount.
3. The off-track retry method of claim 1, wherein the determining the off-track amount comprises:
 - measuring read gains while gradually varying an off-track amount within a predetermined off-track range;
 - determining an off-track direction based upon a gradient of a curve of the measured read gains; and
 - identifying an off-track amount corresponding to a minimum of the measured read gains.
4. The off-track retry method of claim 1, wherein the determining the off-track amount comprises:
 - measuring read gains at a place on the centerline of a track and a plurality of places at either side of the centerline of the track and determining an off-track direction based upon a gradient of a curve of the measured read gains;
 - measuring read gains while gradually varying an off-track amount within a predetermined off-track range; and

identifying an off-track amount corresponding to a minimum of the measured read gains.

5. The off-track retry method of claim 1, wherein the determining of the off-track amount comprises:

determining an off-track direction and a degree to which data is recorded off-track.

6. The off-track retry method of claim 1, wherein the read gain is smallest when data is magnetized in a negative direction off of a centerline of a desired track and the off-track amount reaches a predetermined off-track amount in the negative direction; and the read gain increases as the off-track amount increases.

7. The off-track retry method of claim 1, wherein the read gain is smallest when data is magnetized in a positive direction off of a centerline of a desired track and the off-track amount reaches a predetermined off-track amount in the positive direction; and the read gain decreases as the off-track amount increases.

8. An off-track retry method for recovering data comprising:
measuring an off-track amount at a location where a read error occurs;
reading data based upon the measured off-track amount;
determining whether the read data is normal; and
determining whether the data incorrectly read due to the read error has been recovered.

9. The off-track retry method of claim 8, wherein the measuring the off-track amount at a location wherein a read error occurs comprises:
extracting read gain characteristics while varying the off-track amount; and
determining an off-track direction and a degree based upon the read gain characteristics.

10. The off-track retry method of claim 9, wherein the off-track direction is identified based upon a gradient of a read gain curve showing the read gain characteristics.

11. An off-track retry method for recovering data incorrectly read due to a read error caused by an off-track error in a disk drive, the off-track retry method comprising:

determining an off-track direction and an off-track amount at the same time by measuring read gains at different places while gradually varying the off-track amount within a predetermined off-track range;

reading data using the determined off-track direction and the off-track amount;

determining whether the read data is normal; and

determining whether the data incorrectly read due to the read error has been recovered.

12. The off-track retry method of claim 11, wherein the off-track direction is identified based upon a gradient of a read gain curve showing the measured read gains.

13. An off-track retry method for recovering data incorrectly read due to a read error caused by an off-track error in a disk drive, the off-track retry method comprising:

obtaining an off-track amount by measuring a read gain at three points;

reading the data using the off-track amount;

determining whether the read data is normal; and

determining whether the data incorrectly read due to the read error has been recovered.

14. The off-track retry method of claim 13, wherein the obtaining the off-track amount by measuring a read gain at three points comprises:

measuring the read gain at a centerline of a track;

measuring the read gains at a first point and a second point on either side of the centerline of the track;

determining an off-track direction based upon a gradient of a curve of the measured read gains;

remeasuring the read gains while varying the off-track amount in a predetermined off-track range;

differentiating the measured read gains; and

determining the off-track amount based upon a maximum value of the result of the differentiation.